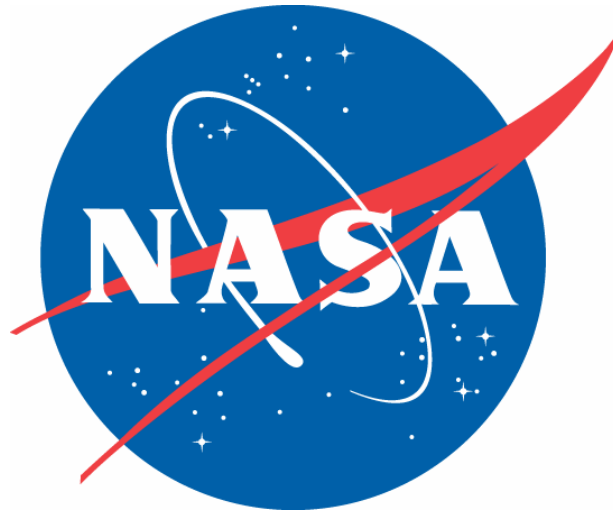


Office of Safety and Mission Assurance  
Review and Assessment Division

# Programmatic Audit & Review Status



**Compliance Verification Workshop**  
**September 26, 2006**

**Stephen M. Wander**  
**PA&R Manager**



# Agenda

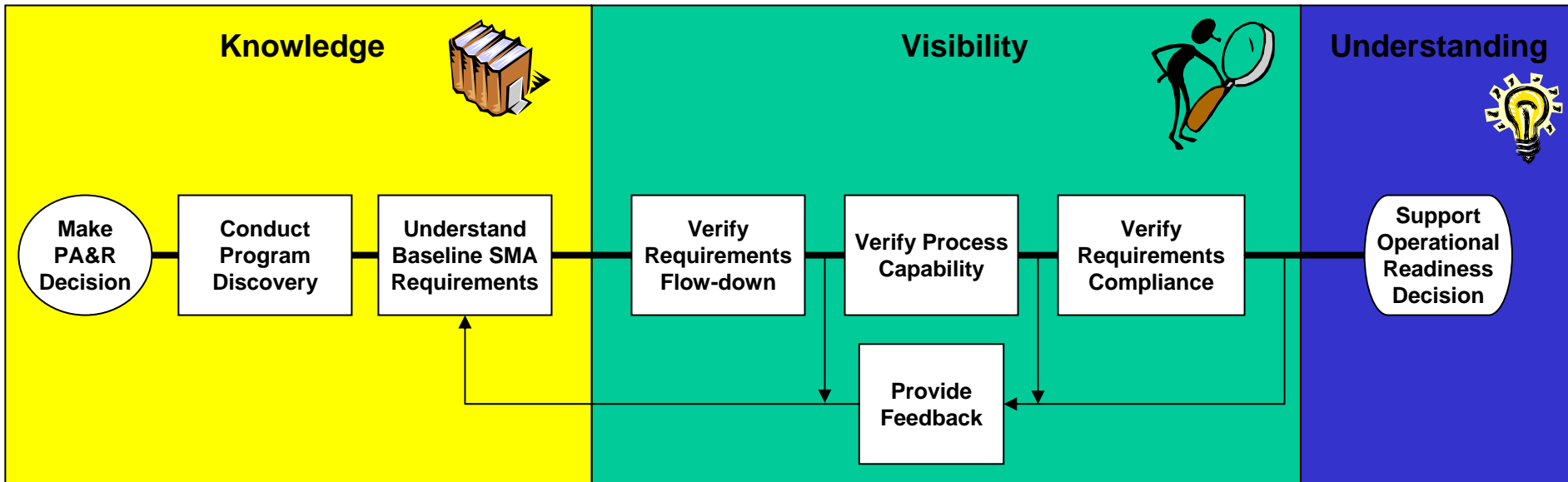
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- **Overview**
- **PA&R Planning Work Group Background and Status**
- **PA&R Planning Work Group Products**
- **Headquarters PA&R Activities**



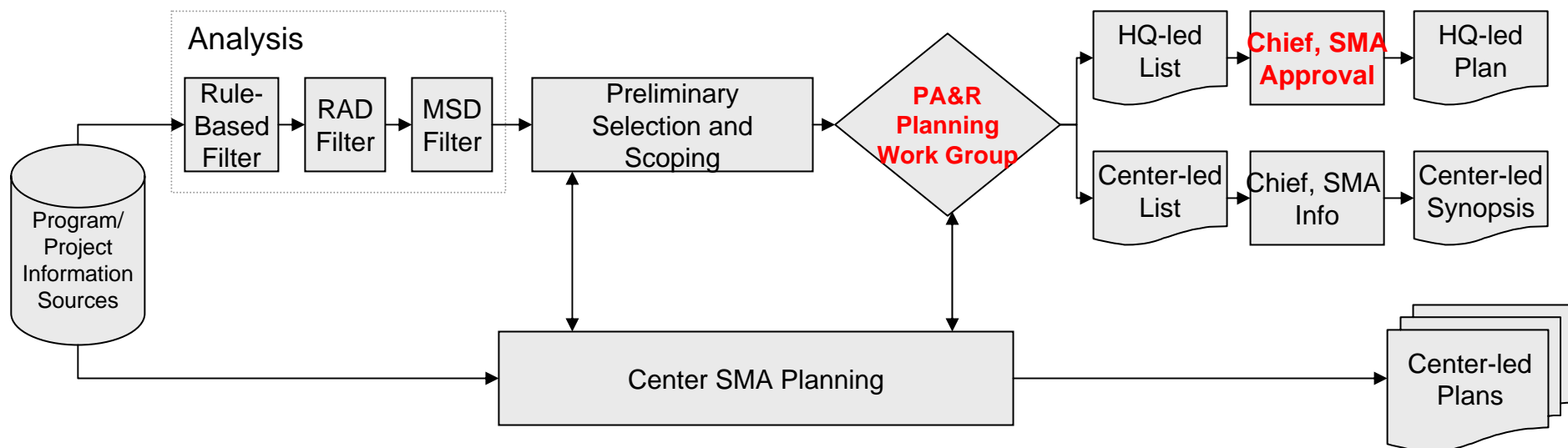
# Top-Level Programmatic Audit & Review (PA&R) Approach

- Develop **Knowledge** of Program/Project SMA requirements
  - Gain **Visibility** into SMA capability and compliance levels
  - Communicate **Understanding** of associated *Residual Risks* to support *Operational Readiness* decisions

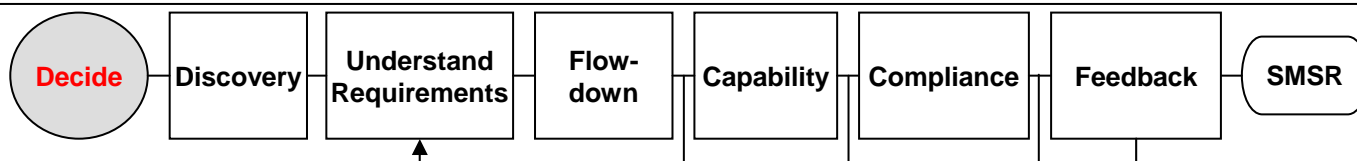




# Overview of PA&R Planning and Selection Process



- **By working and coordinating an annual PA&R schedule:**
  - Programs and centers can improve resource planning
  - Overlap and redundant efforts can be minimized
- **For HQ-led PA&Rs, decision also made whether to delegate to Center SMA IA Organizations**





# PA&R Planning Work Group Background

## ➤ **Work Group Structure**

- Agency-wide SMA membership in Planning Work Group
- Periodic (bi-monthly) telecons
- Annual Planning Meeting

## ➤ **Products**

- Synergistic integration of Agency PA&R activities
- Establishment of annual schedule of PA&R activities
- Published on PBMA-KMS website for Agency-wide access

## ➤ **Approval Authority**

- Chief SMA concurrence on HQ PA&R activity schedule
- Chief SMA awareness of Center PA&R activities



# PA&R Planning Work Group Status

- **Centers identified representatives to the PA&R Planning Work Group.**
- **Conducted bi-monthly telecons (Feb 06, Mar 06, May 06, Aug 06)**
  - Established Planning Work Group charter with Center participation and consensus.
  - Developed the general expectations and output for the annual meeting.
  - Developed and distributed a standard information template for consistent collection of PA&R activities (Center and HQ) to support annual Planning Work Group Meeting.
- **Conducted the first annual Planning Work Group Meeting, at NASA HQ on June 6.**
  - Presented inputs on current/planned HQ and Center PA&R Activities.
  - Discussed integrated planning schedules and products.
  - Provided clarification on the information template. (Revised template was issued with Centers to provide updated responses.)
  - Identified and discussed key PA&R and WG issues



# PA&R Planning Work Group Products



# Objective/Intent of Integrated PA&R Schedule Matrices

- **Matrices provide an integrated compilation of PA&R activities occurring across the agency.**
  - Minimize overlap – promote synergism
  - Assure coverage in critical areas
- **Matrices evolve to provide continuous risk-based assessment and decision-making.**
- **Information will be integrated into the proposed Compliance Verification Information System (CVIS) and PBMA for agency-wide access.**





# SSP Integrated PA&R Overview

8/23/2006

## Space Shuttle Program

| Process<br>Element | P2  | P3                          | P4   | P5   | P6   | P7  | P8  |
|--------------------|---|-----------------------------|--|--|--|---|---|
|                    | Conduct Discovery & SMA Process Map               | Analyze BRS & Identify Gaps | Verify Requirements Flow-down  | Assess Process Capability  | Conduct On-site PA&R   | Provide Feedback                                  | Brief SMSR  |
| RSRM               | HQ:<br>- ATK Phase 1: Feb 05                      |                             | HQ:<br>- ATK Phase 1: Mar-Aug 05   | HQ:<br>- ATK Phase 2: Jan-Jun 06   | HQ:<br>- ATK Phase 2: Jan-Jun 06   | HQ:<br>- ATK Phase 2: Jul 06                      |   |
| Orbiter            | HQ:<br>- Part 1: HR/RID/PRACA:<br>Apr-May 06      |                             | HQ:<br>- Part 1: HR/RID/PRACA:<br>Apr-May 06<br><br>MSFC:<br>- SSME: Fall 06 | HQ:<br>- Part 1: HR/RID/PRACA:<br>Apr-May 06<br><br>KSC:<br>- Orbiter: Jul 05- Sep 07  | HQ:<br>- Part II (TBD): FY07<br><br>MSFC:<br>- SSME: Fall 06               | HQ:<br>- Part 1: HR/RID/PRACA:<br>May-Jul 06      | HQ:<br>- Part I: HR/RID/PRACA:<br>Jun 06 (STS-121)<br><br>- Part II (TBD): FY07 |
| SRB                |   |                             | MSFC:<br>- SRB: Mar 06   | MSFC:<br>- SRB: Mar 06   | MSFC:<br>- SRB: Mar 06   |   |   |
| Tank               |   |                             | MSFC:<br>- External Tank: May 06   | MSFC:<br>- External Tank: May 06   | MSFC:<br>- External Tank: May 06   |   |   |
| Ground Ops         | HQ:<br>- USA/Ground Ops PA&R<br>(for KSC): Jun 04 |                             | HQ:<br>- USA/Ground Ops PA&R<br>(for KSC): Jul-Sep 04                        |  | HQ:<br>- USA/Ground Ops PA&R<br>(for KSC): Oct 04                          | HQ:<br>- USA/Ground Ops PA&R<br>(for KSC): Oct 04 |   |
| Flight Ops         | HQ:<br>- SMA Process Map:<br>TBD                  |                             |  |  |  |   |   |
| Other              |   |                             |  | JSC:<br>- Waivers & Deviations:<br>FY07<br>- SSP Limited Life H/W:<br>FY07-08<br><br>KSC:<br>- Safety and Sustainability (KSC-SA-B, KSC PH, USA MA) Apr 06-07<br><br>- Safety and Sustainability (KSC-SA-B, KSC PH, USA MA)<br>Oct 06 - Jun 07 | JSC:<br>- Waivers & Deviations:<br>FY07<br>- SSP Limited Life H/W:<br>FY07 |   |   |

Key to PA&R Activity: In-Work or Completed (Black) ; Future Committed or Planned (Blue) ; Changes to Previous Revision (Red)



# ISS Integrated PA&R Overview

9/18/2006

## International Space Station Program

| Process<br>Sub-system          | P2<br>Conduct<br>Discovery &<br>SMA Process<br>Map | P3<br>Analyze BRS<br>and Identify<br>Gaps | P4<br>Verify<br>Requirements<br>Flow-down  | P5<br>Assess Process Capability   | P6<br>Conduct<br>On-site PA&R  | P7<br>Provide<br>Feedback | P8<br>Brief<br>SMSR |
|--------------------------------|--|---|--|---|--|---------------------------|---------------------|
| GN&C                           |  |   |  |   |  |                           |                     |
| Comm & Tracking                |  |   |  |   |  |                           |                     |
| ECLSS                          |  |   | <b>GRC:</b><br>- AAMED - Jan '06   |   | <b>GRC:</b><br>- AAMED - Jan '06   |                           |                     |
| Electrical                     |  |   |  |   |  |                           |                     |
| Thermal                        |  |   |  |   |  |                           |                     |
| Computer                       |  |   |  |   |  |                           |                     |
| Payloads & Cargo/Crew Services |  |   | <b>GRC:</b><br>- FCF: Jan '04 - present<br>- MDCA: Nov '05-'06<br>- LMM: Oct '05<br>- BXF: Feb '06 - present<br>- SAME: Feb '06<br>- ZBO: FY07<br>- CSLM-2: FY07<br>- CCF: FY07<br>- InSPACE: FY07<br>- SPICE: FY07<br>- BCAT-3: FY07<br>- MAMS: FY07<br>- SHERE: FY07 | <b>GRC:</b><br>FCF: Jan '04 - present<br><br><b>HQ:</b><br>- ISS PA&R: May '06-Dec '06<br><br><b>JSC:</b><br>- Human Error in Flight Control & On-Orbit Crews: FY07 | <b>GRC:</b><br>- BXF: Feb '06 - present<br>- ZBO: FY07<br>- CSLM-2: FY07<br>- CCF: FY07<br>- InSPACE: FY07<br>- SPICE: FY07<br>- BCAT-3: FY07<br>- MAMS: FY07<br>- SHERE: FY07<br><br><b>HQ:</b><br>- ISS PA&R: May '06 - Dec '06<br><br><b>JSC:</b><br>- Human Error in Flight Control & On-Orbit Crews: FY07 |                           |                     |
| Other SMA Support to Program   |  |   | <b>KSC:</b><br>- Launch and Mission Operations: Oct '06 - Jun '07  | <b>JSC:</b><br>- Waivers/Deviations - FY07<br>- Limited Life of ISS HW - FY07<br>- HW / HW CM - FY07<br>- 2nd Lock/ISS Compliance - FY07<br>- IFI - FY07            | <b>JSC:</b><br>- Waivers/Deviations - FY07<br>- Limited Life of ISS HW - FY07<br>- HW / HW CM - FY07<br>- 2nd Lock/ISS Compliance - FY07<br>- IFI - FY07   |                           |                     |

Key to PA&R Activity: In-Work or Completed (Black) ; Future Committed or Planned (Blue) ; Changes to Previous Revision (Red)



# Constellation Program Integrated PA&R Overview

9/18/2006

## Constellation Program

| Process                              | P2   | P3  | P4   | P5   | P6   | P7               | P8         |
|--------------------------------------|--|---|--|--|--|------------------|------------|
| Sub-system                           | Conduct Discovery & SMA Process Map  | Analyze BRS and Identify Gaps   | Verify Requirements Flow-down  | Assess Process Capability  | Conduct On-site PA&R   | Provide Feedback | Brief SMSR |
| CEV Project                          | JSC:<br>- Trade Study of Disposal vs. Reusability of Cx System/Subsystems: FY07/FY08 | HQ:<br>- CEV PA&R: Feb '07 -Jul '07<br><br>JSC:<br>- Trade Study of Disposal vs. Reusability of Cx System/Subsystems: FY07/FY08 | HQ:<br>- CEV PA&R: Feb '07 -Jul '07<br><br>GRC:<br>- TBD: FY07<br><br>JSC:<br>- Trade Study of Disposal vs. Reusability of Cx System/Subsystems: FY07/FY08 | HQ:<br>- CEV PA&R: Feb '07 -Jul '07<br><br>GRC:<br>- TBD: FY07<br><br>JSC:<br>- Trade Study of Disposal vs. Reusability of Cx System/Subsystems: FY07/FY08 | JSC:<br>- Trade Study of Disposal vs. Reusability of Cx System/Subsystems: FY07/FY08 |                  |            |
| CLV Project                          |  |   | DFRC:<br>- TBD: FY07<br><br>GRC:<br>- TBD: FY07  | DFRC:<br>- TBD: FY07<br><br>GRC:<br>- TBD: FY07  |  |                  |            |
| Ground Ops Project                   |  |   |  |  |  |                  |            |
| Mission Ops Project                  |  |   | DFRC:<br>- TBD: FY07   | DFRC:<br>- TBD: FY07   | DFRC:<br>- TBD: FY07   |                  |            |
| NASA Provided System Projects Office |  |   |  |  |  |                  |            |

Key to PA&R Activity: In-work or Completed (black); Future Committed or Planned (blue); Changes to Previous Revision (Red)



# HQ PA&R Activities



## Completed/Ongoing HQ PA&R Activities

- Space Shuttle Program (SSP) – RSRM
- SSP – Orbiter
- Expendable Launch Vehicle (ELV): Orbital Sciences Corporation (OSC)
- Interstellar Boundary Explorer (IBEX) (PI-Led)
- International Space Station (ISS)
- Expendable Launch Vehicle (ELV): Boeing

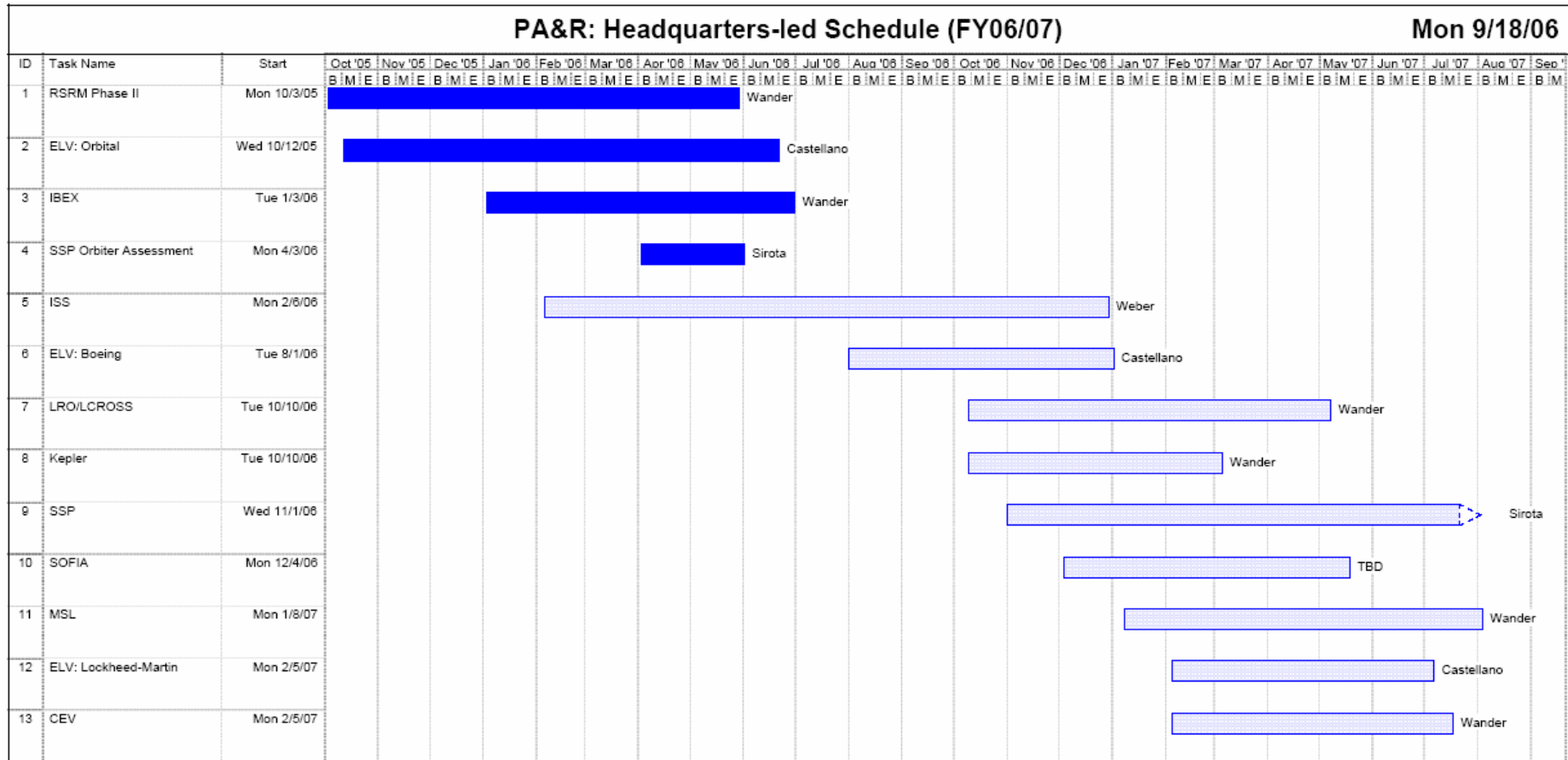


# Planned HQ PA&R Activities

|   | <b>Projected<br/>Start</b> |
|---|----------------------------|
| ➤ <b>Lunar Reconnaissance Orbiter (LRO)/ Lunar CRater Observation and Sensing Satellite (LCROSS)</b>                          | <b>Oct. '06</b>            |
| ➤ <b>Kepler</b>   | <b>Oct. '06</b>            |
| ➤ <b>Space Shuttle Program (SSP)</b> <ul style="list-style-type: none"><li>• Orbiter Follow-on / Other SSP Elements</li></ul> | <b>Nov. '06</b>            |
| ➤ <b>SOFIA</b>  | <b>Dec. '06</b>            |
| ➤ <b>Mars Science Laboratory (MSL)</b>  | <b>Jan. '07</b>            |
| ➤ <b>ELV: Lockheed Martin</b>   | <b>Feb. '07</b>            |
| ➤ <b>Crew Exploration Vehicle (CEV)</b>   | <b>Feb '07</b>             |



# Headquarters Current/Planned PA&R Schedule





# PA&R Breakout Session Agenda

- **NASA/Navy Benchmarking - Overview of OSC ELV Programmatic Audit**
- **Overview of Assurance Process (AP) Map Training**
- **Overview of PA&R Training**
- **PA&R Planning Workgroup Discussion**
- **Questions/Comments**